

WHAT IS CLAIMED IS:

1. A simulator system for teaching patient care to a user, the system comprising:
 - a model of at least a portion of a human body, wherein the model comprises first and second lungs, a first fluid passage in fluid communication with the lungs, and a breathing valve, wherein the breathing valve is adapted to control the flow of fluid through the first fluid passage;
 - a pneumatic module in fluid communication with first fluid passage and adapted for delivering pressurized fluid to the first fluid passage;
 - a processor accessible to the breathing valve; and
 - a memory accessible to the processor for storing a plurality of instructions for execution by the processor, the instructions including instructions for manipulating the breathing valve to regulate the flow of pressurized fluid from the pneumatic module through the first fluid passage to the first and second lungs.
2. The simulator system of claim 1 further comprising a fluid exhaust passage located within the model and adapted for directing fluid that is exiting the first and second lungs out of a mouth of the model.
3. The simulator system of claim 2 wherein the fluid exhaust passage is in fluid communication with the breathing valve.
4. The simulator system of claim 1 further comprising first and second lung valves accessible to the processor and positioned between the breathing valve and the first and second lungs, wherein the first lung valve controls the flow of fluid to the first lung, and wherein the second lung valve controls the flow of fluid to the second lung.

5. The simulator system of claim 1 further comprising:
a first fluid reservoir;
a second fluid passage in fluid communication with the first fluid reservoir and the pneumatic module; and
a fluid reservoir valve positioned in the second fluid passage between the first fluid reservoir and the pneumatic module, wherein the fluid reservoir valve is adapted to inflate the first fluid reservoir by controlling the flow of fluid through the second fluid passage to the first fluid reservoir.
6. The simulator system of claim 5 further comprising a second fluid reservoir associated with the second fluid passage and controllable by the fluid reservoir valve, wherein the first and second fluid reservoirs are positioned within the model to serve as pneumothoracotomy sites.
7. The simulator system of claim 6 wherein the first and second fluid reservoirs each comprise a self-sealing latex septum.
8. The simulator system of claim 6 further comprising a one-way valve positioned between the pneumatic module and the first and second fluid reservoirs.
9. The simulator system of claim 5 wherein the first fluid reservoir is positioned within the model to simulate tongue edema when inflated.
10. The simulator system of claim 5 wherein the first fluid reservoir is positioned within the model to simulate pharyngeal swelling when inflated.
11. The simulator system of claim 5 wherein the first fluid reservoir is positioned within the model to simulate laryngospasm when inflated.

12. The simulator system of claim 5 wherein the fluid reservoir valve is accessible to the processor; and wherein the plurality of instructions stored in the memory for execution by the processor include instructions for manipulating the fluid reservoir valve to regulate the flow of pressurized fluid from the pneumatic module through the second fluid passage to the first fluid reservoir.

13. The simulator system of claim 1 further comprising a model heart, wherein the plurality of instructions stored in the memory for execution by the processor include instructions for altering a pace of the heart.

14. The simulator system of claim 13 wherein the heart is modeled in software.

15. The simulator system of claim 1 further comprising at least one palpable pulse actuator, wherein the plurality of instructions stored in the memory for execution by the processor include instructions for varying an intensity of the actuator.

16. The simulator system of claim 15 wherein the plurality of instructions stored in the memory for execution by the processor include instructions for synchronizing emulated EKG signals with the palpable pulse actuator.

17. The simulator system of claim 1 further comprising a plurality of speakers controllable by the processor.

18. The simulator system of claim 17 wherein the plurality of instructions stored in the memory for execution by the processor include instructions for synchronizing heart sounds projected from at least one of the speakers with a selected cardiac rhythm.

19. The simulator system of claim 17 wherein the plurality of instructions stored in the memory for execution by the processor include instructions for projecting lung sounds via at least one of the speakers.

20. The simulator system of claim 17 further comprising a speech synthesizer adapted for projecting simulated speech via at least one of the speakers.

21. The simulator system of claim 20 wherein the speech is pre-recorded.

22. The simulator system of claim 20 wherein the speech is dynamically generated.

23. The simulator system of claim 1 further comprising a wireless interface between the processor and an external device, wherein the processor is adapted to be controlled by the external device via the wireless interface.

24. The simulator system of claim 1 wherein the model further comprises a plurality of sensors accessible to the processor.

25. The simulator system of claim 24 wherein the sensors include an external cardiac pacemaker sensor.

26. The simulator system of claim 24 wherein the sensors include a chest compression sensor.

27. The simulator system of claim 24 wherein the sensors include a ventilation sensor.

28. The simulator system of claim 24 wherein the sensors include a bilateral blood pressure cuff pressure sensor.

29. The simulator system of claim 24 wherein the sensors include a defibrillation/cardioversion sensor.

30. The simulator system of claim 1 further comprising a battery located within the model.

31. The simulator system of claim 30 further comprising a power supply adapted for providing power to the simulator system using line power or the battery.

32. The simulator system of claim 31 wherein the power supply is adapted to provide power to the simulator system using line power when attached to an external power source, and using battery power when not attached to an external power source.

33. The simulator of claim 30 wherein the battery is removable and adapted for charging by a charging device external to the simulator.

34. A simulation system for teaching patient care to a user, the system comprising:

- a patient simulator adapted for physically and electronically simulating physiological behavior;

- a processor operatively coupled to the simulator for controlling the physiological behavior; and

- a memory accessible to the processor for storing a plurality of instructions for execution by the processor, the instructions including instructions for:

- providing a plurality of scenarios, wherein each scenario is associated with at least one physiological behavior;

- enabling a user to select one of the plurality of scenarios; and

- simulating the physiological behavior of the selected scenario using the patient simulator.

35. The simulation system of claim 34 further comprising instructions for linking together a plurality of scenarios into a single scenario.

36. The simulation system of claim 34 further comprising instructions for trending, wherein a parameter associated with a scenario is altered as the scenario is executed.

37. The simulation system of claim 34 further comprising a wireless interface associated with the processor, wherein the processor is controllable via the wireless interface by an external device.

38. The simulation system of claim 34 wherein the plurality of instructions stored in the memory for execution by the processor include instructions for creating a plurality of waveforms that correspond to the selected scenario.

39. The simulation system of claim 38 wherein at least some of the waveforms are dynamically generated by the processor.

40. A simulator system for teaching patient care to a user, the system comprising:

- a model comprising first and second lungs, a first air passage adapted for providing air to the lungs, and a first valve, wherein the first valve is adapted to control the flow of air through the first air passage;

- a pneumatic module adapted for delivering air to the first air passage;

- a processor adapted for controlling the first valve; and

- a memory accessible to the processor for storing a plurality of instructions for execution by the processor, the instructions including instructions for controlling the first valve to regulate the flow of air from the pneumatic module through the first air passage to the first and second lungs.

41. The simulator system of claim 40 further comprising:
a second air passage associated with an inflatable reservoir and the pneumatic module; and

a second valve positioned between the inflatable reservoir and the pneumatic module, wherein the second valve is adapted to inflate the inflatable reservoir by controlling the flow of air through the second air passage.

42. The simulator system of claim 41 wherein the pneumatic module comprises:

a compressor;
a primary reservoir in fluid communication with the compressor;
a secondary reservoir in fluid communication with the primary reservoir;
a regulator positioned between the primary and secondary reservoirs, wherein the regulator is adapted to maintain the secondary reservoir at a lower pressure than the primary reservoir; and

a compressor controller in fluid communication with the compressor and the primary reservoir.

43. The simulator system of claim 42 wherein the first air passage is in fluid communication with the secondary reservoir.

44. The simulator system of claim 43 wherein the second air passage is in fluid communication with the primary reservoir.

45. The simulator system of claim 42 wherein the compressor controller comprises:

a pressure transducer in fluid communication with the primary reservoir;
a comparator for comparing a pressure detected by the pressure transducer to a predefined pressure threshold; and

a relay associated with the comparator and the compressor, wherein the relay is adapted for providing power to the compressor upon receiving a signal from the comparator.